

WHAT IS CLAIMED IS:

1. A method for heat treating an article, comprising the steps of:
 providing an article having a nominal composition, in weight percent, of about 4 percent aluminum, about 4 percent molybdenum, about 2 percent tin, about 0.5 percent silicon, balance titanium and impurities;
 processing the article to form a martensitic structure therein, the step of processing including the steps of
 first heating the article to a first-heating temperature of greater than about 1600°F, and thereafter
 first cooling the article to a temperature of less than about 800°F; thereafter
 second heating the article to a second-heating temperature of from about 1275°F to about 1375°F for a time of from about 1 to about 7 hours; and thereafter
 second cooling the article to a temperature of less than about 800°F at a second cooling rate that does not exceed about 15°F per second.
2. The method of claim 1, wherein the step of providing the article includes the step of
 providing the article having a first portion with a thickness of less than 0.2 inch and a second portion with a thickness of greater than 0.2 inch.
3. The method of claim 1, wherein the step of providing the article includes the step of
 providing a gas turbine compressor blade.
4. The method of claim 1, wherein the step of processing includes the step of
 forging the article at the first-heating temperature.
5. The method of claim 1, wherein the step of processing includes the step of
 forging the article at a temperature of about 1650°F.
6. The method of claim 1, wherein the step of processing includes the step

weld repairing the article at the first-heating temperature.

second heating to the second-heating temperature of about 1350°F for a time of from about 4 to about 6 hours.

second cooling the article at the second cooling rate of from about 1°F per second to about 15°F per second.

9. The method of claim 1, including an additional step, after the step of second cooling, of stress relieving the article at a temperature of from about 1000°F to about 1050°F.

10. The method of claim 1, wherein the step of second heating includes a time of from about 4 to about 6 hours at the second-heating temperature.

11. The method of claim 1, wherein the step of second heating includes the step of wrapping the article in a foil selected from the group consisting of commercially pure titanium foil and tantalum foil.

12. A method for heat treating an article, comprising the steps of:
providing an article formed of an alpha-beta titanium-base alloy;
processing the article to form a martensitic structure therein, the step of
processing including the steps of

first heating the article to a first-heating temperature of greater than about 1600°F, and thereafter

first cooling the article to a temperature of less than about 800°F; thereafter

second heating the article to a second-heating temperature of from about 1275°F to about 1375°F for a time of from about 1 to about 7 hours; and thereafter

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providing the article formed of the alpha-beta titanium-base alloy having more than about 3.5 weight percent molybdenum.

providing the article having a first portion with a thickness of less than 0.2 inch and a second portion with a thickness of greater than 0.2 inch.

providing a gas turbine compressor blade.

forging the article at the first-heating temperature.

weld repairing the article at the first-heating temperature.

second heating to the second-heating temperature of about 1350°F for a time of from about 4 to about 6 hours.

stress relieving the article at a temperature of from about 1000°F to about 1050°F.

20. The method of claim 12, wherein the step of second heating includes a

time of from about 4 to about 6 hours at the second-heating temperature.

21. The method of claim 17, wherein the step of second heating includes the step of

wrapping the article in a foil selected from the group consisting of commercially pure titanium foil and tantalum foil.

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